

CTI-URS

Environmental Services, LLC

October 31, 2018
16170869



Mr. Tom Barounis
U.S. Environmental Protection Agency, Region 5
SR-6J
Ralph Metcalfe Building
77 West Jackson Boulevard
Chicago, Illinois 60604

**Re: 2018 Groundwater Monitoring Report A
SVAD-001, TNT Washout Facility
Savanna Army Depot Activity
Contract W912QR-13-D-0048, Delivery Order 0003**

Dear Mr. Barounis:

On behalf of the Army, enclosed are two hard copies of the Groundwater Sampling Report for SVAD-001, TNT Washout Facility. A PDF copy of this report is being transmitted by e-mail.

The enclosed presents the results of groundwater sampling completed August 20 through August 21, 2018 at SVAD-001. All field activities were completed in accordance with the UFP-QAPP (URS 2015). All chemical analytical data were reviewed following the UFP-QAPP (URS 2015) and found to be acceptable for their intended use. This report presents a summary of the sampling, tabulated field water quality parameters, groundwater analytical results, and sample collection field sheets. This report also includes the results of the annual LUC inspection.

If you have any questions, please contact Mr. Dick Kennard, USACE, at (502) 315-6323.

Sincerely,

A handwritten signature in black ink, appearing to read "Chris Artz".

Chris Artz, P.E. CHMM
Project Manager

Enclosures

cc:

Charlene Falco, IEPA (2 hard copies, PDF e-mailed)
Dick Kennard, USACE (1 hard copy, PDF e-mailed)
Cathy Collins, SVDA (1 hard copy, PDF e-mailed)
Tom Linear, BRACD (1 hard copy, PDF e-mailed)
Rob Stenson, CUES Project Manager (1 hard copy, PDF e-mailed)

TABLE 1
SVAD-001 SUMMARY OF SAMPLING FOR CHEMICAL ANALYSIS
SAVANNA ARMY DEPOT, ILLINOIS

Site	Well ID	Sample ID	Date	Nitroaromatics/ Nitramines (8330A)	Nitrate and Nitrite (9056A)	QA Split	MS/MSD	Duplicate	Comments
SVAD-001	302101	GW-302101-18A	8/21/2018	X	X				
SVAD-001	302104	GW-302104-18A	8/21/2018	X	X				
SVAD-001	302105	GW-302105-18A	8/21/2018	X	X	X		X	Duplicate ID = GW-802105-18A
SVAD-001	302106	GW-302106-18A	8/21/2018	X	X				
SVAD-001	302107	GW-302107-18A	8/21/2018	X	X				
SVAD-001	302119	GW-302119-18A	8/21/2018	X	X				
SVAD-001	302120	GW-302120-18A	8/21/2018	X	X		X		
SVAD-001	302122	GW-302122-18A	8/21/2018	X	X				
SVAD-001	302124	GW-302124-18A	8/21/2018	X	X				
SVAD-001	MW-21-03	GW-MW-21-03-18A	8/21/2018	X	X				
SVAD-001	IDW	IDW-18A	8/21/2018	X					

Notes:

ID = identification

IDW = Investigation Derived Waste

MS/ MSD = matrix spike / matrix spike duplicate

QA = quality assurance

SVAD-001 = TNT Washout Facility

TABLE 2
SVAD-001 SUMMARY OF FIELD WATER QUALITY PARAMETERS
SAVANNA ARMY DEPOT, ILLINOIS

Well ID	Date	Depth to Groundwater (feet BTOC) ¹	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	pH	Oxidation / Reduction Potential (mV)	Temperature (°C)	Conductivity (µS/cm)	Comments
302101	8/21/2018	8.94	0.23	14.46	5.50	205.80	15.17	89.89	
302104	8/21/2018	6.92	0.14	10.57	5.91	38.20	15.38	207.93	
302105	8/21/2018	6.64	0.13	7.44	6.25	169.40	18.64	358.81	Dup and QA Split
302106	8/21/2018	6.40	0.11	31.18	6.78	131.80	15.43	570.58	
302107	8/21/2018	9.44	0.09	0.72	7.31	130.70	15.69	383.65	
302119	8/21/2018	6.28	0.10	1.28	6.88	36.20	15.17	387.85	
302120	8/21/2018	6.83	0.14	2.45	6.80	-18.60	17.22	574.74	MS/MSD
302122	8/21/2018	8.12	4.29	0.86	7.69	121.20	20.67	525.16	
302124	8/21/2018	7.97	0.10	6.58	6.63	147.60	20.20	705.12	
MW-21-03	8/21/2018	5.54	2.12	79.68	7.30	138.90	16.14	503.22	

Notes:

¹ Water level collected prior to and separate from sample collection

°C = degrees Celsius

µS/cm = milliSiemens per centimeter

BTOC = below top of casing

ID = identification

mg/L = milligrams per liter

mV = millivolts

MW = Monitoring Well

NTUs = Nephelometric Turbidity Units

TABLE 3
SVAD-001 SUMMARY OF ANALYTES DETECTED IN GROUNDWATER MONITORING WELLS
SAVANNA ARMY DEPOT, ILLINOIS

FIELD IDENTIFICATION DATE COLLECTED	PAL	GW-302101-18A August 21, 2018				GW-302104-18A August 21, 2018				GW-302105-18A August 21, 2018				GW-802105-18A August 21, 2018			
		Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual
NITROAROMATICS/ NITRAMINES (µg/L)																	
1,3,5-Trinitrobenzene	840	0.15	0.3	0.5	J	<	0.3	0.5	U	34	1.5	2.5		34	6	10	
2,4,6-Trinitrotoluene	14	58	6	10		<	0.3	0.5	U	240	6	10		210	6	10	
2,4-Dinitrotoluene	0.1	3.5	0.08	0.1		<	0.08	0.1	U	35	0.4	0.5		34	1.6	2	
2-Amino-4,6-dinitrotoluene	39*	0.6	0.3	0.5		<	0.3	0.5	U	<	0.3	50	U	<	0.3	50	U
4-Amino-2,6-dinitrotoluene	39*	0.88	0.3	0.5		<	0.3	0.5	U	22	0.3	0.5		28	0.3	0.5	
ANIONS (mg/L)																	
Nitrate	10	4.5	0.18	0.5		1.3	0.18	0.5		2.7	0.18	0.5		2.7	0.18	0.5	
Nitrite	1	0.088	0.13	0.3	J	<	0.13	0.3	U	<	0.13	0.3	U	<	0.13	0.3	U

Notes:

J = Estimated

LOD = Limit of Detection

LOQ - Limit of Quantitation

mg/L = milligram per liter

µg/L = microgram per liter

PAL = Project Action Limit

Qual = Qualifier

U = Nondetect

< = nondetect at the LOD

*As total aminodinitrotoluenes

Shaded results exceeded PAL

TABLE 3
SVAD-001 SUMMARY OF ANALYTES DETECTED IN GROUNDWATER MONITORING WELLS
SAVANNA ARMY DEPOT, ILLINOIS

FIELD IDENTIFICATION		GW-302106-18A				GW-302107-18A				GW-302119-18A				GW-302120-18A			
DATE COLLECTED		August 21, 2018				August 21, 2018				August 21, 2018				August 21, 2018			
	PAL	Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual
NITROAROMATICS/ NITRAMINES (µg/L)																	
1,3,5-Trinitrobenzene	840	0.17	0.3	0.5	J	<	0.3	0.5	U	16	0.3	0.5		<	0.3	0.5	U
2,4,6-Trinitrotoluene	14	<	0.3	0.5	U	<	0.3	0.5	U	6	0.3	0.5		<	0.3	0.5	U
2,4-Dinitrotoluene	0.1	2.1	0.08	0.1		<	0.08	0.1	U	3	0.08	0.1		0.076	0.08	0.1	J
2-Amino-4,6-dinitrotoluene	39*	<	0.3	0.5	U	<	0.3	0.5	U	1.5	0.3	0.5		<	0.3	0.5	U
4-Amino-2,6-dinitrotoluene	39*	<	0.3	0.5	U	<	0.3	0.5	U	1.5	0.3	0.5		0.28	0.3	0.5	J
ANIONS (mg/L)																	
Nitrate	10	64.5	0.9	2.5		17	0.18	0.5		2.1	0.18	0.5		2.8	0.18	0.5	
Nitrite	1	0.16	0.13	0.3	J	0.18	0.13	0.3	J	<	0.13	0.3	U	<	0.13	0.3	U

Notes:

J = Estimated

LOD = Limit of Detection

LOQ - Limit of Quantitation

mg/L = milligram per liter

µg/L = microgram per liter

PAL = Project Action Limit

Qual = Qualifier

U = Nondetect

< = nondetect at the LOD

*As total aminodinitrotoluenes

Shaded results exceeded PAL

TABLE 3
SVAD-001 SUMMARY OF ANALYTES DETECTED IN GROUNDWATER MONITORING WELLS
SAVANNA ARMY DEPOT, ILLINOIS

FIELD IDENTIFICATION		GW-302122-18A				GW-302124-18A				GW-MW-21-03-18A				IDW-18A			
DATE COLLECTED	PAL	August 21, 2018				August 21, 2018				August 21, 2018				August 21, 2018			
		Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual	Result	LOD	LOQ	Qual
NITROAROMATICS/ NITRAMINES (µg/L)																	
1,3,5-Trinitrobenzene	840	8	0.3	0.5		<	0.3	0.5	U	0.58	0.3	0.5		5.7	0.3	0.5	
2,4,6-Trinitrotoluene	14	0.3	0.3	0.5	J	<	0.3	0.5	U	<	0.3	0.5	U	15	0.3	0.5	
2,4-Dinitrotoluene	0.1	<	0.08	0.1	U	0.38	0.08	0.1		<	0.08	0.1	U	5.7	0.08	0.1	
2-Amino-4,6-dinitrotoluene	39*	5.5	0.3	0.5		1.1	0.3	0.5		0.82	0.3	0.5		<	0.3	0.5	U
4-Amino-2,6-dinitrotoluene	39*	8.4	0.3	0.5		1.8	0.3	0.5		0.63	0.3	0.5		<	0.3	0.5	U
ANIONS (mg/L)																	
Nitrate	10	17.8	0.18	0.5		84.2	0.9	2.5		40.6	0.18	0.5					
Nitrite	1	<	0.13	0.3	U	<	0.13	0.3	U	<	0.13	0.3	U				

Notes:

J = Estimated

LOD = Limit of Detection

LOQ = Limit of Quantitation

mg/L = milligram per liter

µg/L = microgram per liter

PAL = Project Action Limit

Qual = Qualifier

U = Nondetect

< = nondetect at the LOD

*As total aminodinitrotoluenes

Shaded results exceeded PAL

WATER SAMPLING COLLECTION FIELD SHEETS

Low-Flow Test Report:

Test Date / Time: 8/21/2018 8:39:52 AM
Project: SVAD 302101
Operator Name: Ryan H.

Location Name: 302101 Well Diameter: 2 in Screen Length: 20 ft Top of Screen: 9 ft Total Depth: 29 ft Initial Depth to Water: 8.4 ft	Pump Type: Peristaltic Tubing Type: LDPE Tubing Inner Diameter: 0.1875 in Tubing Length: 34 ft Pump Intake From TOC: 19 ft Estimated Total Volume Pumped: 5711.667 ml Flow Cell Volume: 130 ml Final Flow Rate: 100 ml/min Final Draw Down: 0.54 ft	Instrument Used: Aqua TROLL 600 Serial Number: 509271
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Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 3 %	+/- 3 %	+/- 10 %	+/- 10	+/- 1000 %	+/- 5	
8/21/2018 8:39 AM	00:00	5.53 pH	16.46 °C	88.81 µS/cm	1.91 mg/L	1.42 NTU	160.7 mV	8.40 ft	100.00 ml/min
8/21/2018 8:44 AM	05:00	5.54 pH	15.85 °C	89.39 µS/cm	1.95 mg/L	1.78 NTU	169.5 mV	8.57 ft	100.00 ml/min
8/21/2018 8:46 AM	07:07	5.51 pH	15.64 °C	89.87 µS/cm	1.90 mg/L	1.47 NTU	174.0 mV	8.97 ft	100.00 ml/min
8/21/2018 8:51 AM	12:07	5.52 pH	15.43 °C	90.57 µS/cm	1.68 mg/L	1.11 NTU	179.5 mV	8.94 ft	100.00 ml/min
8/21/2018 8:56 AM	17:07	5.48 pH	15.21 °C	90.26 µS/cm	1.52 mg/L	1.11 NTU	185.9 mV	8.94 ft	100.00 ml/min
8/21/2018 9:01 AM	22:07	5.49 pH	15.21 °C	90.30 µS/cm	1.40 mg/L	3.69 NTU	189.3 mV	8.94 ft	100.00 ml/min
8/21/2018 9:06 AM	27:07	5.49 pH	15.12 °C	90.15 µS/cm	1.14 mg/L	3.99 NTU	192.9 mV	8.94 ft	100.00 ml/min
8/21/2018 9:11 AM	32:07	5.46 pH	15.15 °C	90.14 µS/cm	0.74 mg/L	4.49 NTU	197.1 mV	8.94 ft	100.00 ml/min
8/21/2018 9:16 AM	37:07	5.49 pH	15.16 °C	90.01 µS/cm	0.53 mg/L	3.97 NTU	198.4 mV	8.94 ft	100.00 ml/min
8/21/2018 9:21 AM	42:07	5.50 pH	15.23 °C	90.20 µS/cm	0.40 mg/L	5.71 NTU	199.9 mV	8.94 ft	100.00 ml/min
8/21/2018 9:26 AM	47:07	5.48 pH	15.14 °C	89.66 µS/cm	0.28 mg/L	6.93 NTU	203.5 mV	8.94 ft	100.00 ml/min
8/21/2018 9:31 AM	52:07	5.51 pH	15.18 °C	90.00 µS/cm	0.25 mg/L	12.21 NTU	203.5 mV	8.94 ft	100.00 ml/min
8/21/2018 9:36 AM	57:07	5.50 pH	15.17 °C	89.89 µS/cm	0.23 mg/L	14.46 NTU	205.8 mV	8.94 ft	100.00 ml/min

Samples

Sample ID:	Description:
GW - 302101-18A	

Low-Flow Test Report:

Test Date / Time: 8/21/2018 1:29:28 PM
Project: SVAD 302104
Operator Name: Phil R.

Location Name: 302104 Well Diameter: 2 in Casing Type: PVC Screen Length: 20 ft Top of Screen: 8.8 ft Total Depth: 28.8 ft Initial Depth to Water: 6.92 ft	Pump Type: Peristaltic Tubing Type: LDPE Tubing Inner Diameter: 0.1875 in Tubing Length: 34 ft Pump Intake From TOC: 19 ft Estimated Total Volume Pumped: 3500 ml Flow Cell Volume: 130 ml Final Flow Rate: 100 ml/min Final Draw Down: 8.2 ft	Instrument Used: Aqua TROLL 600 Serial Number: 518534
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Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 3 %	+/- 3 %	+/- 10 %	+/- 10	+/- 1000 %	+/- 5	
8/21/2018 1:29 PM	00:00	6.48 pH	21.74 °C	165.22 µS/cm	3.48 mg/L	2.45 NTU	74.4 mV	6.92 ft	100.00 ml/min
8/21/2018 1:34 PM	05:00	6.04 pH	17.43 °C	171.17 µS/cm	0.25 mg/L	1.41 NTU	86.5 mV	6.92 ft	100.00 ml/min
8/21/2018 1:39 PM	10:00	5.85 pH	16.72 °C	178.12 µS/cm	0.18 mg/L	1.71 NTU	80.8 mV	6.92 ft	100.00 ml/min
8/21/2018 1:44 PM	15:00	5.84 pH	16.15 °C	190.05 µS/cm	0.15 mg/L	4.91 NTU	50.9 mV	6.92 ft	100.00 ml/min
8/21/2018 1:49 PM	20:00	5.87 pH	15.84 °C	199.14 µS/cm	0.14 mg/L	6.12 NTU	31.2 mV	6.92 ft	100.00 ml/min
8/21/2018 1:54 PM	25:00	5.88 pH	15.48 °C	204.16 µS/cm	0.14 mg/L	6.80 NTU	29.1 mV	6.92 ft	100.00 ml/min
8/21/2018 1:59 PM	30:00	5.90 pH	15.42 °C	207.38 µS/cm	0.13 mg/L	7.56 NTU	34.0 mV	6.92 ft	100.00 ml/min
8/21/2018 2:04 PM	35:00	5.91 pH	15.38 °C	207.93 µS/cm	0.14 mg/L	10.57 NTU	38.2 mV	6.92 ft	100.00 ml/min

Samples

Sample ID:	Description:
GW-302104-18A	

Low-Flow Test Report:

Test Date / Time: 8/21/2018 12:10:55 PM
Project: SVAD 302105
Operator Name: Phil R.

Location Name: 302105 Well Diameter: 2 in Screen Length: 20 ft Top of Screen: 9.2 ft Total Depth: 29.2 ft Initial Depth to Water: 6.64 ft	Pump Type: Peristaltic Tubing Type: LDPE Tubing Inner Diameter: 0.1875 in Tubing Length: 34 ft Pump Intake From TOC: 19 ft Estimated Total Volume Pumped: 2000 ml Flow Cell Volume: 130 ml Final Flow Rate: 100 ml/min Final Draw Down: 0 ft	Instrument Used: Aqua TROLL 600 Serial Number: 509271
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Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 3 %	+/- 3 %	+/- 10 %	+/- 10	+/- 1000 %	+/- 5	
8/21/2018 12:10 PM	00:00	6.43 pH	26.33 °C	442.15 µS/cm	2.08 mg/L	4.19 NTU	143.6 mV	6.64 ft	100.00 ml/min
8/21/2018 12:15 PM	05:00	6.28 pH	20.34 °C	346.59 µS/cm	0.20 mg/L	1.03 NTU	158.7 mV	6.64 ft	100.00 ml/min
8/21/2018 12:20 PM	10:00	6.29 pH	19.44 °C	352.82 µS/cm	0.17 mg/L	0.94 NTU	162.2 mV	6.64 ft	100.00 ml/min
8/21/2018 12:25 PM	15:00	6.26 pH	19.09 °C	355.14 µS/cm	0.12 mg/L	2.69 NTU	166.4 mV	6.64 ft	100.00 ml/min
8/21/2018 12:30 PM	20:00	6.25 pH	18.64 °C	358.81 µS/cm	0.13 mg/L	7.44 NTU	169.4 mV	6.64 ft	100.00 ml/min

Samples

Sample ID:	Description:
GW-302105-18A / Dup GW-802105-18A and QA split	

Low-Flow Test Report:

Test Date / Time: 8/21/2018 9:47:20 AM

Project: SVAD 302106

Operator Name: Phil R.

Location Name: 302106 Well Diameter: 2 in Casing Type: PVC Screen Length: 20 ft Top of Screen: 8.9 ft Total Depth: 28.9 ft Initial Depth to Water: 6.4 ft	Pump Type: Peristaltic Tubing Type: LDPE Tubing Inner Diameter: 0.1875 in Tubing Length: 22.9 ft Pump Intake From TOC: 18.9 ft Estimated Total Volume Pumped: 5500 ml Flow Cell Volume: 130 ml Final Flow Rate: 100 ml/min Final Draw Down: 6.3 ft	Instrument Used: Aqua TROLL 600 Serial Number: 518534
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Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 3 %	+/- 3 %	+/- 10 %	+/- 10	+/- 1000 %	+/- 5	
8/21/2018 9:47 AM	00:00	6.90 pH	15.79 °C	680.27 µS/cm	0.49 mg/L	30.86 NTU	158.7 mV	6.40 ft	100.00 ml/min
8/21/2018 9:52 AM	05:00	6.90 pH	15.68 °C	668.72 µS/cm	0.15 mg/L	19.21 NTU	147.6 mV	6.40 ft	100.00 ml/min
8/21/2018 9:57 AM	10:00	6.89 pH	15.52 °C	656.42 µS/cm	0.11 mg/L	25.68 NTU	138.9 mV	6.40 ft	100.00 ml/min
8/21/2018 10:02 AM	15:00	6.87 pH	15.58 °C	648.96 µS/cm	0.16 mg/L	24.09 NTU	134.1 mV	6.40 ft	100.00 ml/min
8/21/2018 10:07 AM	20:00	6.86 pH	15.60 °C	638.11 µS/cm	0.19 mg/L	29.16 NTU	133.1 mV	6.40 ft	100.00 ml/min
8/21/2018 10:12 AM	25:00	6.84 pH	15.56 °C	625.92 µS/cm	0.15 mg/L	36.95 NTU	132.6 mV	6.40 ft	100.00 ml/min
8/21/2018 10:17 AM	30:00	6.84 pH	15.61 °C	620.22 µS/cm	0.21 mg/L	61.87 NTU	132.8 mV	6.40 ft	100.00 ml/min
8/21/2018 10:22 AM	35:00	6.83 pH	15.70 °C	609.17 µS/cm	0.17 mg/L	47.18 NTU	132.7 mV	6.40 ft	100.00 ml/min
8/21/2018 10:27 AM	40:00	6.82 pH	15.64 °C	600.32 µS/cm	0.16 mg/L	60.48 NTU	132.5 mV	6.40 ft	100.00 ml/min
8/21/2018 10:32 AM	45:00	6.80 pH	15.58 °C	588.49 µS/cm	0.17 mg/L	57.67 NTU	132.4 mV	6.40 ft	100.00 ml/min
8/21/2018 10:37 AM	50:00	6.80 pH	15.50 °C	579.00 µS/cm	0.13 mg/L	104.87 NTU	132.1 mV	6.40 ft	100.00 ml/min
8/21/2018 10:42 AM	55:00	6.78 pH	15.43 °C	570.58 µS/cm	0.11 mg/L	31.18 NTU	131.8 mV	6.40 ft	100.00 ml/min

Samples

Sample ID:	Description:
GW-302106-18A	

Low-Flow Test Report:

Test Date / Time: 8/21/2018 9:57:04 AM
Project: SVAD 302107
Operator Name: Ryan H.

Location Name: 302107 Well Diameter: 2 in Screen Length: 10 ft Top of Screen: 66.33 ft Total Depth: 76.33 ft Initial Depth to Water: 9.41 ft	Pump Type: Peristaltic Tubing Type: LDPE Tubing Inner Diameter: 0.1875 in Tubing Length: 81 ft Pump Intake From TOC: 69 ft Estimated Total Volume Pumped: 2880 ml Flow Cell Volume: 130 ml Final Flow Rate: 100 ml/min Final Draw Down: 0.03 ft	Instrument Used: Aqua TROLL 600 Serial Number: 509271
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est Notes:

ow-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 3 %	+/- 3 %	+/- 10 %	+/- 10	+/- 1000 %	+/- 5	
8/21/2018 9:57 AM	00:00	6.99 pH	18.45 °C	390.17 µS/cm	5.22 mg/L	3.17 NTU	150.1 mV	9.41 ft	100.00 ml/min
8/21/2018 9:57 AM	00:24	7.12 pH	18.08 °C	385.31 µS/cm	3.05 mg/L	2.69 NTU	138.4 mV	9.41 ft	100.00 ml/min
8/21/2018 9:57 AM	00:37	7.13 pH	17.62 °C	377.33 µS/cm	2.30 mg/L	0.92 NTU	137.2 mV	9.41 ft	100.00 ml/min
8/21/2018 10:00 AM	03:48	7.25 pH	16.30 °C	380.88 µS/cm	0.32 mg/L	2.72 NTU	131.3 mV	9.44 ft	100.00 ml/min
8/21/2018 10:05 AM	08:48	7.29 pH	15.86 °C	383.89 µS/cm	0.22 mg/L	0.73 NTU	131.1 mV	9.44 ft	100.00 ml/min
8/21/2018 10:10 AM	13:48	7.30 pH	15.78 °C	383.37 µS/cm	0.14 mg/L	0.71 NTU	131.1 mV	9.44 ft	100.00 ml/min
8/21/2018 10:15 AM	18:48	7.31 pH	15.69 °C	383.19 µS/cm	0.12 mg/L	4.49 NTU	131.0 mV	9.44 ft	100.00 ml/min
8/21/2018 10:20 AM	23:48	7.31 pH	15.89 °C	385.86 µS/cm	0.10 mg/L	0.70 NTU	130.0 mV	9.44 ft	100.00 ml/min
8/21/2018 10:25 AM	28:48	7.31 pH	15.69 °C	383.65 µS/cm	0.09 mg/L	0.72 NTU	130.7 mV	9.44 ft	100.00 ml/min

amples

Sample ID:	Description:
GW-302107-18A	

Low-Flow Test Report:

Test Date / Time: 8/21/2018 11:11:27 AM
Project: SVAD 302119
Operator Name: Phil R.

Location Name: 302119 Well Diameter: 4 in Casing Type: PVC Screen Length: 10.4 ft Top of Screen: 21.1 ft Total Depth: 31.5 ft Initial Depth to Water: 6.28 ft	Pump Type: Peristaltic Tubing Type: LDPE Tubing Inner Diameter: 0.1875 in Tubing Length: 26 ft Pump Intake From TOC: 22 ft Estimated Total Volume Pumped: 3000 ml Flow Cell Volume: 130 ml Final Flow Rate: 100 ml/min Final Draw Down: 6.3 ft	Instrument Used: Aqua TROLL 600 Serial Number: 518534
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est Notes:

ow-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 3 %	+/- 3 %	+/- 10 %	+/- 10	+/- 1000 %	+/- 5	
8/21/2018 11:11 AM	00:00	6.93 pH	17.02 °C	385.01 µS/cm	4.71 mg/L	1.08 NTU	82.7 mV	6.28 ft	100.00 ml/min
8/21/2018 11:16 AM	05:00	6.88 pH	15.27 °C	388.84 µS/cm	0.24 mg/L	1.07 NTU	65.2 mV	6.28 ft	100.00 ml/min
8/21/2018 11:21 AM	10:00	6.88 pH	15.15 °C	388.23 µS/cm	0.16 mg/L	1.03 NTU	46.8 mV	6.28 ft	100.00 ml/min
8/21/2018 11:26 AM	15:00	6.88 pH	15.21 °C	390.37 µS/cm	0.13 mg/L	1.06 NTU	31.0 mV	6.28 ft	100.00 ml/min
8/21/2018 11:31 AM	20:00	6.87 pH	15.08 °C	388.66 µS/cm	0.12 mg/L	1.11 NTU	29.3 mV	6.28 ft	100.00 ml/min
8/21/2018 11:36 AM	25:00	6.87 pH	15.16 °C	389.46 µS/cm	0.11 mg/L	1.01 NTU	32.1 mV	6.28 ft	100.00 ml/min
8/21/2018 11:41 AM	30:00	6.88 pH	15.17 °C	387.85 µS/cm	0.10 mg/L	1.28 NTU	36.2 mV	6.28 ft	100.00 ml/min

amples

Sample ID:	Description:
GW-302119-18A	

Low-Flow Test Report:

Test Date / Time: 8/21/2018 12:00:23 PM

Project: SVAD-302120

Operator Name:Phil R.

Location Name: 302120 Well Diameter: 4 in Casing Type: PVC Screen Length: 10.4 ft Top of Screen: 14.6 ft Total Depth: 25 ft Initial Depth to Water: 6.83 ft	Pump Type: Peristaltic Tubing Type: LDPE Tubing Inner Diameter: 0.1875 in Tubing Length: 30 ft Pump Intake From TOC: 20 ft Estimated Total Volume Pumped: 5500 ml Flow Cell Volume: 130 ml Final Flow Rate: 100 ml/min Final Draw Down: 6.85 ft	Instrument Used: Aqua TROLL 600 Serial Number: 518534
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est Notes:

ow-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 3 %	+/- 3 %	+/- 10 %	+/- 10	+/- 1000 %	+/- 5	
8/21/2018 12:00 PM	00:00	6.87 pH	17.81 °C	568.68 µS/cm	5.52 mg/L	1.43 NTU	30.7 mV	6.83 ft	100.00 ml/min
8/21/2018 12:05 PM	05:00	6.78 pH	16.74 °C	576.71 µS/cm	0.34 mg/L	1.36 NTU	27.0 mV	6.83 ft	100.00 ml/min
8/21/2018 12:10 PM	10:00	6.78 pH	16.65 °C	581.45 µS/cm	0.21 mg/L	1.07 NTU	2.0 mV	6.83 ft	100.00 ml/min
8/21/2018 12:15 PM	15:00	6.77 pH	16.84 °C	577.38 µS/cm	0.17 mg/L	1.91 NTU	-4.8 mV	6.83 ft	100.00 ml/min
8/21/2018 12:20 PM	20:00	6.77 pH	16.89 °C	577.37 µS/cm	0.16 mg/L	1.40 NTU	2.0 mV	6.83 ft	100.00 ml/min
8/21/2018 12:25 PM	25:00	6.77 pH	16.99 °C	576.23 µS/cm	0.15 mg/L	2.24 NTU	4.8 mV	6.83 ft	100.00 ml/min
8/21/2018 12:30 PM	30:00	6.77 pH	16.84 °C	575.07 µS/cm	0.14 mg/L	2.99 NTU	-5.5 mV	6.83 ft	100.00 ml/min
8/21/2018 12:35 PM	35:00	6.77 pH	17.00 °C	575.64 µS/cm	0.14 mg/L	5.82 NTU	-24.0 mV	6.83 ft	100.00 ml/min
8/21/2018 12:40 PM	40:00	6.78 pH	17.00 °C	576.81 µS/cm	0.14 mg/L	5.73 NTU	-34.2 mV	6.83 ft	100.00 ml/min
8/21/2018 12:45 PM	45:00	6.79 pH	16.94 °C	575.69 µS/cm	0.14 mg/L	2.61 NTU	-32.4 mV	6.83 ft	100.00 ml/min
8/21/2018 12:50 PM	50:00	6.80 pH	17.20 °C	575.40 µS/cm	0.14 mg/L	5.75 NTU	-25.6 mV	6.83 ft	100.00 ml/min
8/21/2018 12:55 PM	55:00	6.80 pH	17.22 °C	574.74 µS/cm	0.14 mg/L	2.45 NTU	-18.6 mV	6.83 ft	100.00 ml/min

amples

Sample ID:	Description:
GW-302120-18A	MS/MSD

Low-Flow Test Report:

Test Date / Time: 8/21/2018 11:35:10 AM
Project: SVDA 302122
Operator Name: Phil R.

Location Name: 302122 Well Diameter: 4 in Screen Length: 10.24 ft Top of Screen: 64.76 ft Total Depth: 75 ft Initial Depth to Water: 8.12 ft	Pump Type: Peristaltic Tubing Type: LDPE Tubing Inner Diameter: 0.1875 in Tubing Length: 80 ft Pump Intake From TOC: 66 ft Estimated Total Volume Pumped: 1500 ml Flow Cell Volume: 130 ml Final Flow Rate: 100 ml/min Final Draw Down: 0 ft	Instrument Used: Aqua TROLL 600 Serial Number: 509271
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est Notes:

ow-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 3 %	+/- 3 %	+/- 10 %	+/- 10	+/- 1000 %	+/- 5	
8/21/2018 11:35 AM	00:00	7.67 pH	28.02 °C	0.93 µS/cm	6.96 mg/L	1.16 NTU	118.5 mV	8.12 ft	100.00 ml/min
8/21/2018 11:40 AM	05:00	7.64 pH	22.01 °C	521.69 µS/cm	4.11 mg/L	0.92 NTU	115.0 mV	8.12 ft	100.00 ml/min
8/21/2018 11:45 AM	10:00	7.69 pH	21.54 °C	525.66 µS/cm	4.19 mg/L	0.80 NTU	118.3 mV	8.12 ft	100.00 ml/min
8/21/2018 11:50 AM	15:00	7.69 pH	20.67 °C	525.16 µS/cm	4.29 mg/L	0.86 NTU	121.2 mV	8.12 ft	100.00 ml/min

amples

Sample ID:	Description:
GW 302122 18A	

Low-Flow Test Report:

Test Date / Time: 8/21/2018 10:58:33 AM
Project: SVDA 302124
Operator Name: Ryan H.

Location Name: 302124 Well Diameter: 4 in Screen Length: 10.4 ft Top of Screen: 19.6 ft Total Depth: 30 ft Initial Depth to Water: 7.81 ft	Pump Type: Peristaltic Tubing Type: LDPE Tubing Inner Diameter: 0.1875 in Tubing Length: 24.6 ft Pump Intake From TOC: 24 ft Estimated Total Volume Pumped: 1531.667 ml Flow Cell Volume: 130 ml Final Flow Rate: 100 ml/min Final Draw Down: 0.16 ft	Instrument Used: Aqua TROLL 600 Serial Number: 509271
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est Notes:

ow-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 3 %	+/- 3 %	+/- 10 %	+/- 10	+/- 1000 %	+/- 5	
8/21/2018 10:58 AM	00:00	6.68 pH	20.03 °C	656.37 µS/cm	1.06 mg/L	2.59 NTU	141.4 mV	7.81 ft	100.00 ml/min
8/21/2018 10:58 AM	00:19	6.68 pH	19.73 °C	683.93 µS/cm	0.90 mg/L	2.70 NTU	140.3 mV	7.88 ft	100.00 ml/min
8/21/2018 11:03 AM	05:19	6.64 pH	19.20 °C	708.59 µS/cm	0.17 mg/L	2.27 NTU	143.1 mV	7.97 ft	100.00 ml/min
8/21/2018 11:08 AM	10:19	6.64 pH	19.45 °C	708.77 µS/cm	0.12 mg/L	2.60 NTU	145.2 mV	7.97 ft	100.00 ml/min
8/21/2018 11:13 AM	15:19	6.63 pH	20.20 °C	705.12 µS/cm	0.10 mg/L	6.58 NTU	147.6 mV	7.97 ft	100.00 ml/min

Samples

Sample ID:	Description:
GW-302124-18A	

Low-Flow Test Report:

Test Date / Time: 8/21/2018 8:21:37 AM
Project: SVAD MW-21-03
Operator Name:Phil R.

Location Name: MW-21-03 Well Diameter: 4 in Casing Type: PVC Screen Length: 10 ft Top of Screen: 21.83 ft Total Depth: 31.83 ft Initial Depth to Water: 5.54 ft	Pump Type: Peristaltic Tubing Type: LDPE Tubing Inner Diameter: 0.1875 in Tubing Length: 26.83 ft Pump Intake From TOC: 22.83 ft Estimated Total Volume Pumped: 4500 ml Flow Cell Volume: 130 ml Final Flow Rate: 100 ml/min Final Draw Down: 5.6 ft	Instrument Used: Aqua TROLL 600 Serial Number: 518534
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est Notes:

ow-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 3 %	+/- 3 %	+/- 10 %	+/- 10	+/- 1000 %	+/- 5	
8/21/2018 8:21 AM	00:00	7.07 pH	19.47 °C	476.92 µS/cm	6.55 mg/L	1.43 NTU	147.6 mV	5.54 ft	100.00 ml/min
8/21/2018 8:26 AM	05:00	6.98 pH	16.92 °C	491.97 µS/cm	1.66 mg/L	1.66 NTU	148.6 mV	5.54 ft	100.00 ml/min
8/21/2018 8:31 AM	10:00	7.01 pH	16.62 °C	497.50 µS/cm	1.67 mg/L	3.53 NTU	149.3 mV	5.54 ft	100.00 ml/min
8/21/2018 8:36 AM	15:00	7.08 pH	16.38 °C	500.65 µS/cm	1.78 mg/L	9.71 NTU	148.3 mV	5.54 ft	100.00 ml/min
8/21/2018 8:41 AM	20:00	7.13 pH	16.17 °C	500.51 µS/cm	1.86 mg/L	15.65 NTU	147.1 mV	5.54 ft	100.00 ml/min
8/21/2018 8:46 AM	25:00	7.18 pH	16.30 °C	502.83 µS/cm	1.94 mg/L	19.87 NTU	145.3 mV	5.54 ft	100.00 ml/min
8/21/2018 8:51 AM	30:00	7.23 pH	16.08 °C	501.49 µS/cm	2.01 mg/L	36.96 NTU	143.5 mV	5.54 ft	100.00 ml/min
8/21/2018 8:56 AM	35:00	7.26 pH	16.03 °C	499.58 µS/cm	2.04 mg/L	50.36 NTU	141.9 mV	5.54 ft	100.00 ml/min
8/21/2018 9:01 AM	40:00	7.28 pH	16.11 °C	501.20 µS/cm	2.07 mg/L	56.69 NTU	140.5 mV	5.54 ft	100.00 ml/min
8/21/2018 9:06 AM	45:00	7.30 pH	16.14 °C	503.22 µS/cm	2.12 mg/L	79.68 NTU	138.9 mV	5.54 ft	100.00 ml/min

Samples

Sample ID:	Description:
GW-MW-21-03-18A	

DATA VERIFICATION REPORTS

Savanna Army Depot Activity Verification

Laboratory and SDG#: EMAX 18H179

Date Verified: 9/19/2018

Guidance: DoD QSM, Version 5, (DoD, 2013), DoD QSM Louisville Supplement (USACE 2007)

Applicable QAPP: UFP-QAPP AE Services SVAD -001 TNT Washout Facility (CUES, 2015)

Applicable Analytical Methods: 8330A, 9056A

CUES Chemist: Jeff Aust

CUES ITR: Jared DeSadier

Sample Identification #	Date Collected	Date Received	Matrix	Analysis
GW-302105-18A	8/21/2018	8/22/2018	Water	Nitroaromatics/Nitramines (8330A), Nitrate and Nitrite (9056A)

1.0 Laboratory Case Narrative \ Cooler Receipt Form

Verification Criteria	Yes	No	N/A
Were any DoD QSM deviations noted in the laboratory case narrative?	X		
Were DoD QSM corrective actions followed if deviations were noted?	X		
Were any issues noted in the cooler receipt form?		X	

The laboratory case narrative indicated the MS/MSD recoveries for nitrite were below evaluation criteria. This issue is addressed in Section 10.0. The cooler receipt form indicated no problems or discrepancies were encountered.

2.0 Sample Documentation

Verification Criteria	Yes	No
Were all samples documented correctly on the chain-of-custody (COC) and samples labels?	X	
Were all sample identifications (IDs) documented correctly on sample labels?	X	
Did samples listed on COCs match the sample labels?	X	
Were samples relinquished properly on the COC?	X	

3.0 Holding Time

Verification Criteria	Yes	No	N/A
Were all samples extracted/analyzed within holding time?	X		
Were samples outside holding time extracted/analyzed < 2x holding time?			X
Were samples outside holding time extracted/analyzed > 2x holding time?			X

4.0 Initial Calibration

Method 8330A Initial Calibration Criteria			
Instrument:	81		
Date of Calibration:	3/7/2018		
	Yes	No	N/A
Was the ICAL analyzed prior to sample analysis	X		
Option 1: RSD for each analyte $\leq 20\%$?	X		
Option 2: If linear least squares regression was used was the $r^2 \geq 0.99$			X
Option 3: If non-linear regression was used was the coefficient of determination $r^2 \geq 0.99$?			X

Savanna Army Depot Activity Verification

Laboratory and SDG#: EMAX 18H179

Date Verified: 9/19/2018

Guidance: DoD QSM, Version 5, (DoD, 2013), DoD QSM Louisville Supplement (USACE 2007)

Applicable QAPP: UFP-QAPP AE Services SVAD -001 TNT Washout Facility (CUES, 2015)

Applicable Analytical Methods: 8330A, 9056A

CUES Chemist: Jeff Aust

CUES ITR: Jared DeSadier

Method 8330A Initial Calibration Criteria			
Instrument:	81		
Date of Calibration:	3/7/2018		
	Yes	No	N/A
If non-linear regression was used were 6 points used for second order and 7 points for third order?			X

Method 8330A Initial Calibration Criteria			
Instrument:	E6		
Date of Calibration:	4/19/2018		
	Yes	No	N/A
Was the ICAL analyzed prior to sample analysis	X		
Option 1: RSD for each analyte $\leq 20\%$?	X		
Option 2: If linear least squares regression was used was the $r^2 \geq 0.99$			X
Option 3: If non-linear regression was used was the coefficient of determination $r^2 \geq 0.99$?			X
If non-linear regression was used were 6 points used for second order and 7 points for third order?			X

Method 9056A Initial Calibration Criteria			
Instrument:	D7		
Date of Calibration:	7/16/2018		
	Yes	No	N/A
Was a minimum of three standards and a calibration blank used for ICAL?	X		
Were $r^2 \geq 0.99$ for all analytes?	X		

5.0 Initial Calibration Verification [(ICV) Second Source]

Method 8330A ICV Criteria (Filename)	ICV81C0701		
Instrument:	81		
Date of Initial Calibration Verification:	3/8/2018		
	Yes	No	N/A
Was the ICV analyzed after each calibration?	X		
Were all reported analytes within $\pm 15\%$ of true value?	X		

Method 8330A ICV Criteria (Filename)	IEXE6D1901		
Instrument:	E6		
Date of Initial Calibration Verification:	4/20/2018		
	Yes	No	N/A
Was the ICV analyzed after each calibration?	X		
Were all reported analytes within $\pm 15\%$ of true value?	X		

Savanna Army Depot Activity Verification

Laboratory and SDG#: EMAX 18H179

Date Verified: 9/19/2018

Guidance: DoD QSM, Version 5, (DoD, 2013), DoD QSM Louisville Supplement (USACE 2007)

Applicable QAPP: UFP-QAPP AE Services SVAD -001 TNT Washout Facility (CUES, 2015)

Applicable Analytical Methods: 8330A, 9056A

CUES Chemist: Jeff Aust

CUES ITR: Jared DeSadier

Method 9056A ICV Criteria (Date)	7/16/2018 17:18		
Instrument:	D7		
	Yes	No	N/A
Was the ICV analyzed after each ICAL, prior to the beginning of a sample analysis?	X		
Were all reported analytes within $\pm 10\%$ of true value?	X		

6.0 Continuing Calibration Verification (CCV)

Method 8330A CCV Criteria (Filename)	CEX81C07064		
Instrument:	81		
Date of Calibration Verification:	8/28/2018		
	Yes	No	N/A
Was the CCV analyzed prior to sample analysis, after every 10 field samples, and at the end of the analysis sequence?	X		
Were all project analytes within established retention time windows?	X		
Were all reported analytes and surrogates within $\pm 15\%$ of true value?	X		

Method 8330A CCV Criteria (Filename)	CEX81C07065		
Instrument:	81		
Date of Calibration Verification:	8/28/2018		
	Yes	No	N/A
Was the CCV analyzed prior to sample analysis, after every 10 field samples, and at the end of the analysis sequence?	X		
Were all project analytes within established retention time windows?	X		
Were all reported analytes and surrogates within $\pm 15\%$ of true value?	X		

Method 8330A CCV Criteria (Filename)	CEXE6D19031_32		
Instrument:	E6		
Date of Calibration Verification:	8/29/2018		
	Yes	No	N/A
Was the CCV analyzed prior to sample analysis, after every 10 field samples, and at the end of the analysis sequence?	X		
Were all project analytes within established retention time windows?	X		
Were all reported analytes and surrogates within $\pm 15\%$ of true value?	X		

Method 8330A CCV Criteria (Filename)	CEXE6D19033_34		
Instrument:	E6		
Date of Calibration Verification:	8/29/2018		
	Yes	No	N/A
Was the CCV analyzed prior to sample analysis, after every 10 field samples, and at the end of the analysis sequence?	X		

Savanna Army Depot Activity Verification

Laboratory and SDG#: EMAX 18H179

Date Verified: 9/19/2018

Guidance: DoD QSM, Version 5, (DoD, 2013), DoD QSM Louisville Supplement (USACE 2007)

Applicable QAPP: UFP-QAPP AE Services SVAD -001 TNT Washout Facility (CUES, 2015)

Applicable Analytical Methods: 8330A, 9056A

CUES Chemist: Jeff Aust

CUES ITR: Jared DeSadier

Method 8330A CCV Criteria (Filename)	CEXE6D19033_34		
Instrument:	E6		
Date of Calibration Verification:	8/29/2018		
	Yes	No	N/A
Were all project analytes within established retention time windows?	X		
Were all reported analytes and surrogates within $\pm 15\%$ of true value?	X		

Method 9056A CCV Criteria (Date)	All CCVs on 8/22/2018		
Instrument:	D7		
	Yes	No	N/A
Were the CCVs analyzed after every 10 samples and at the end of the analysis sequence?	X		
Were all reported analytes within $\pm 10\%$ of true value?	X		

7.0 Blank Samples

Blank Criteria	Yes	No	N/A
Were method blanks analyzed with every preparatory batch?	X		
Were target analytes detected $> \frac{1}{2}$ the LOQ and $> 1/10$ the amount measured in any sample or $1/10$ the regulatory limit (whichever is greater)?		X	
Were target analytes detected in method, trip or calibration blanks?		X	

8.0 Laboratory Control Sample (LCS)

LCS Criteria	Yes	No	N/A
Was an LCS analyzed with every preparatory batch?	X		
Were LCS recoveries within acceptance criteria listed in the UFP-QAPP?	X		

9.0 Surrogate Recoveries

Method 8330A Surrogate Criteria	Yes	No	N/A
Were surrogate spikes added to all field and QC samples?	X		
Were surrogate recoveries within acceptance criteria listed in the UFP-QAPP?	X		

10.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD) / Recoveries RPDs

MS/MSD Criteria	Yes	No	N/A
Were MS/MSD samples analyzed with every preparatory batch?	X		
Were MS/MSD samples collected for this SDG?	X		
Were MS/MSD recoveries/RPDs within acceptance criteria listed in the UFP-QAPP?		X	

Savanna Army Depot Activity Verification

Laboratory and SDG#: EMAX 18H179

Date Verified: 9/19/2018

Guidance: DoD QSM, Version 5, (DoD, 2013), DoD QSM Louisville Supplement (USACE 2007)

Applicable QAPP: UFP-QAPP AE Services SVAD -001 TNT Washout Facility (CUES, 2015)

Applicable Analytical Methods: 8330A, 9056A

CUES Chemist: Jeff Aust

CUES ITR: Jared DeSadier

Sample GW-302105-18A was spiked and analyzed for nitrate and nitrite.

MS/MSD ID	Parameter	Analyte	MS/MSD Recovery	RPD	MS/MSD/RPD Criteria
GW-302105-18A	Anions	Nitrite	36/37	1	87-111/15

Analytical data that required qualification based on MS/MSD data are included in the table below.

Field ID	Parameter	Analyte	Qualification
GW-302105-18A	Anions	Nitrite	UJ

11.0 Matrix Duplicate

Matrix Duplicate (MD) Criteria	Yes	No	N/A
Were MD samples analyzed with every preparatory batch?	X		
Were MD samples collected for this SDG?	X		
Were MD RPDs within acceptance criteria listed in the UFP-QAPP?	X		

Sample GW-302105-18A was duplicated and analyzed for nitrate and nitrite.

12.0 Field Duplicate Samples

Field Duplicate Criteria	Yes	No	N/A
Were field duplicate samples collected for this SDG? (if yes, list below)		X	
Were parent sample / field duplicate RPDs $\leq 30\%$ for water samples and $\leq 50\%$ for soils for analytes that had concentrations $> 5x$ the LOQ?			X
Were the differences between the parent sample / field duplicate $< 2x$ the LOQ for analytes that had concentrations $< 5x$ the LOQ?			X

13.0 Sensitivity

Sensitivity Criteria	Yes	No	N/A
Was the laboratory sensitivity consistent with project (QAPP) requirements?	X		
Did all analytes meet sensitivity requirements?	X		

14.0 Additional Qualifications

Additional Qualification Criteria	Yes	No	N/A
Were common laboratory contaminants detected?		X	
Was professional judgment used to qualify data (if yes, list below)			X

Savanna Army Depot Activity Verification

Laboratory and SDG#: EMAX 18H179

Date Verified: 9/19/2018

Guidance: DoD QSM, Version 5, (DoD, 2013), DoD QSM Louisville Supplement (USACE 2007)

Applicable QAPP: UFP-QAPP AE Services SVAD -001 TNT Washout Facility (CUES, 2015)

Applicable Analytical Methods: 8330A, 9056A

CUES Chemist: Jeff Aust

CUES ITR: Jared DeSadier

15.0 Completeness

Completeness Criteria	Yes	No	N/A
Were any data rejected during the verification process?		X	
Were any samples lost, broken, or in any other manner in not verified?		X	
Were samples analyses requested performed, the correct analyte lists used and correct sample preparation and analyses methods and units utilized?	X		

Savanna Army Depot Activity Verification

Laboratory and SDG#: APPL 86660

Date Verified: 9/11/2018

Guidance: DoD QSM, Version 5, (DoD, 2013), DoD QSM Louisville Supplement (USACE 2007)

Applicable QAPP: UFP-QAPP AE Services SVAD -001 TNT Washout Facility (CUES, 2015)

Applicable Analytical Methods: 8330A and 9056A

CUES Chemist: Jeff Aust

CUES ITR: Jared DeSadier

Sample Identification #	Date Collected	Date Received	Matrix	Analysis
GW-302101-18A	8/21/2018	8/22/2018	Water	Nitroaromatics/Nitramines (8330A), Nitrate and Nitrite (9056A)
GW-302107-18A	8/21/2018	8/22/2018	Water	Nitroaromatics/Nitramines (8330A), Nitrate and Nitrite (9056A)
GW-302124-18A	8/21/2018	8/22/2018	Water	Nitroaromatics/Nitramines (8330A), Nitrate and Nitrite (9056A)
GW-302122-18A	8/21/2018	8/22/2018	Water	Nitroaromatics/Nitramines (8330A), Nitrate and Nitrite (9056A)
GW-302105-18A	8/21/2018	8/22/2018	Water	Nitroaromatics/Nitramines (8330A), Nitrate and Nitrite (9056A)
GW-802105-18A	8/21/2018	8/22/2018	Water	Nitroaromatics/Nitramines (8330A), Nitrate and Nitrite (9056A)
IDW-18A	8/21/2018	8/22/2018	Water	Nitroaromatics/Nitramines (8330A)
GW-MW-21-03-18A	8/21/2018	8/22/2018	Water	Nitroaromatics/Nitramines (8330A), Nitrate and Nitrite (9056A)
GW-302106-18A	8/21/2018	8/22/2018	Water	Nitroaromatics/Nitramines (8330A), Nitrate and Nitrite (9056A)
GW-302119-18A	8/21/2018	8/22/2018	Water	Nitroaromatics/Nitramines (8330A), Nitrate and Nitrite (9056A)
GW-302120-18A	8/21/2018	8/22/2018	Water	Nitroaromatics/Nitramines (8330A), Nitrate and Nitrite (9056A)
GW-302104-18A	8/21/2018	8/22/2018	Water	Nitroaromatics/Nitramines (8330A), Nitrate and Nitrite (9056A)

1.0 Laboratory Case Narrative \ Cooler Receipt Form

Verification Criteria	Yes	No	N/A
Were any DoD QSM deviations noted in the laboratory case narrative?		X	
Were DoD QSM corrective actions followed if deviations were noted?			X
Were any issues noted in the cooler receipt form?	X		

The laboratory case narrative indicated no deviations were encountered. The cooler receipt form indicated samples GW-302105 and GW-802105 were changed to GW-302105-18A and GW-802105-18A, respectively per request by the CUES chemist. No qualification of data was required.

Savanna Army Depot Activity Verification

Laboratory and SDG#: APPL 86660

Date Verified: 9/11/2018

Guidance: DoD QSM, Version 5, (DoD, 2013), DoD QSM Louisville Supplement (USACE 2007)

Applicable QAPP: UFP-QAPP AE Services SVAD -001 TNT Washout Facility (CUES, 2015)

Applicable Analytical Methods: 8330A and 9056A

CUES Chemist: Jeff Aust

CUES ITR: Jared DeSadier

2.0 Sample Documentation

Verification Criteria	Yes	No
Were all samples documented correctly on the chain-of-custody (COC) and samples labels?		X
Were all sample identifications (IDs) documented correctly on sample labels?		X
Did samples listed on COCs match the sample labels?	X	
Were samples relinquished properly on the COC?	X	

Samples GW-302105-18A and GW-802105-18A were listed incorrectly on the COC and sample labels. Per instruction from the CUES chemist, the samples were logged using the correct sample IDs. No qualification of data was required.

3.0 Holding Time

Verification Criteria	Yes	No	N/A
Were all samples extracted/analyzed within holding time?	X		
Were samples outside holding time extracted/analyzed < 2x holding time?			X
Were samples outside holding time extracted/analyzed > 2x holding time?			X

4.0 Initial Calibration

Method 8330A Initial Calibration Criteria			
Instrument:	Waldorf		
Date of Calibration:	8/28/2018		
	Yes	No	N/A
Was the ICAL analyzed prior to sample analysis	X		
Option 1: RSD for each analyte $\leq 20\%$?	X		
Option 2: If linear least squares regression was used was the $r^2 \geq 0.99$			X
Option 3: If non-linear regression was used was the coefficient of determination $r^2 \geq 0.99$?			X
If non-linear regression was used were 6 points used for second order and 7 points for third order?			X

Method 8330A Initial Calibration Criteria			
Instrument:	Statler		
Date of Calibration:	8/24/2018		
	Yes	No	N/A
Was the ICAL analyzed prior to sample analysis	X		
Option 1: RSD for each analyte $\leq 20\%$?	X		
Option 2: If linear least squares regression was used was the $r^2 \geq 0.99$			X
Option 3: If non-linear regression was used was the coefficient of determination $r^2 \geq 0.99$?			X
If non-linear regression was used were 6 points used for second order and 7 points for third order?			X

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CUES ITR: Jared DeSadier

Method 9056A Initial Calibration Criteria			
Instrument:	Dionex		
Date of Calibration:	7/26/2018		
	Yes	No	N/A
Was a minimum of three standards and a calibration blank used for ICAL?	X		
Were $r^2 \geq 0.99$ for all analytes?	X		

5.0 Initial Calibration Verification [(ICV) Second Source]

Method 8330A ICV Criteria (Filename)	0828_000013_14		
Instrument:	Waldorf		
Date of Initial Calibration Verification:	8/28/2018		
	Yes	No	N/A
Was the ICV analyzed after each calibration?	X		
Were all reported analytes within $\pm 15\%$ of true value?	X		

Method 8330A ICV Criteria (Filename)	0824_000045-47.D		
Instrument:	Statler		
Date of Initial Calibration Verification:	8/25/2018		
	Yes	No	N/A
Was the ICV analyzed after each calibration?	X		
Were all reported analytes within $\pm 15\%$ of true value?	X		

Method 9056A ICV Criteria (Date)	7/26/2018 12:58		
Instrument:	Dionex		
	Yes	No	N/A
Was the ICV analyzed after each ICAL, prior to the beginning of a sample analysis?	X		
Were all reported analytes within $\pm 10\%$ of true value?	X		

6.0 Continuing Calibration Verification (CCV)

Method 8330A CCV Criteria (Filename)	0828_000017.D		
Instrument:	Waldorf		
Date of Calibration Verification:	8/28/2018		
	Yes	No	N/A
Was the CCV analyzed prior to sample analysis, after every 10 field samples, and at the end of the analysis sequence?	X		
Were all project analytes within established retention time windows?	X		
Were all reported analytes and surrogates within $\pm 15\%$ of true value?	X		

Savanna Army Depot Activity Verification

Laboratory and SDG#: APPL 86660

Date Verified: 9/11/2018

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Applicable QAPP: UFP-QAPP AE Services SVAD -001 TNT Washout Facility (CUES, 2015)

Applicable Analytical Methods: 8330A and 9056A

CUES Chemist: Jeff Aust

CUES ITR: Jared DeSadier

Method 8330A CCV Criteria (Filename)	0828_000032.D		
Instrument:	Waldorf		
Date of Calibration Verification:	8/29/2018		
	Yes	No	N/A
Was the CCV analyzed prior to sample analysis, after every 10 field samples, and at the end of the analysis sequence?	X		
Were all project analytes within established retention time windows?	X		
Were all reported analytes and surrogates within $\pm 15\%$ of true value?	X		

Method 8330A CCV Criteria (Filename)	0828_000042.D		
Instrument:	Waldorf		
Date of Calibration Verification:	8/29/2018		
	Yes	No	N/A
Was the CCV analyzed prior to sample analysis, after every 10 field samples, and at the end of the analysis sequence?	X		
Were all project analytes within established retention time windows?	X		
Were all reported analytes and surrogates within $\pm 15\%$ of true value?	X		

Method 8330A CCV Criteria (Filename)	0830_000036.D		
Instrument:	Waldorf		
Date of Calibration Verification:	8/31/2018		
	Yes	No	N/A
Was the CCV analyzed prior to sample analysis, after every 10 field samples, and at the end of the analysis sequence?	X		
Were all project analytes within established retention time windows?	X		
Were all reported analytes and surrogates within $\pm 15\%$ of true value?	X		

Method 8330A CCV Criteria (Filename)	0830_000047.D		
Instrument:	Waldorf		
Date of Calibration Verification:	8/31/2018		
	Yes	No	N/A
Was the CCV analyzed prior to sample analysis, after every 10 field samples, and at the end of the analysis sequence?	X		
Were all project analytes within established retention time windows?	X		
Were all reported analytes and surrogates within $\pm 15\%$ of true value?	X		

Method 8330A CCV Criteria (Filename)	0824_000048_49.D		
Instrument:	Statler		
Date of Calibration Verification:	8/25/2018		
	Yes	No	N/A
Was the CCV analyzed prior to sample analysis, after every 10 field samples, and at the end of the analysis sequence?	X		

Savanna Army Depot Activity Verification

Laboratory and SDG#: APPL 86660

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Applicable Analytical Methods: 8330A and 9056A

CUES Chemist: Jeff Aust

CUES ITR: Jared DeSadier

Method 8330A CCV Criteria (Filename)	0824 000048 49.D		
Instrument:	Statler		
Date of Calibration Verification:	8/25/2018		
	Yes	No	N/A
Were all project analytes within established retention time windows?	X		
Were all reported analytes and surrogates within $\pm 15\%$ of true value?	X		

Method 8330A CCV Criteria (Filename)	0824 000063 64.D		
Instrument:	Statler		
Date of Calibration Verification:	8/25/2018		
	Yes	No	N/A
Was the CCV analyzed prior to sample analysis, after every 10 field samples, and at the end of the analysis sequence?	X		
Were all project analytes within established retention time windows?	X		
Were all reported analytes and surrogates within $\pm 15\%$ of true value?	X		

Method 8330A CCV Criteria (Filename)	0824 000079 80.D		
Instrument:	Statler		
Date of Calibration Verification:	8/26/2018		
	Yes	No	N/A
Was the CCV analyzed prior to sample analysis, after every 10 field samples, and at the end of the analysis sequence?	X		
Were all project analytes within established retention time windows?	X		
Were all reported analytes and surrogates within $\pm 15\%$ of true value?	X		

Method 9056A CCV Criteria (Date)	All CCVs on 8/22/2018		
Instrument:	Dionex		
	Yes	No	N/A
Were the CCVs analyzed after every 10 samples and at the end of the analysis sequence?	X		
Were all reported analytes within $\pm 10\%$ of true value?	X		

Method 9056A CCV Criteria (Date)	All CCVs on 8/23/2018		
Instrument:	Dionex		
	Yes	No	N/A
Were the CCVs analyzed after every 10 samples and at the end of the analysis sequence?	X		
Were all reported analytes within $\pm 10\%$ of true value?	X		

Savanna Army Depot Activity Verification

Laboratory and SDG#: APPL 86660

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Applicable QAPP: UFP-QAPP AE Services SVAD -001 TNT Washout Facility (CUES, 2015)

Applicable Analytical Methods: 8330A and 9056A

CUES Chemist: Jeff Aust

CUES ITR: Jared DeSadier

7.0 Blank Samples

Blank Criteria	Yes	No	N/A
Were method blanks analyzed with every preparatory batch?	X		
Were target analytes detected > ½ the LOQ and > 1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater)?		X	
Were target analytes detected in method, trip or calibration blanks?		X	

8.0 Laboratory Control Sample (LCS)

LCS Criteria	Yes	No	N/A
Was an LCS analyzed with every preparatory batch?	X		
Were LCS recoveries within acceptance criteria listed in the UFP-QAPP?	X		

9.0 Surrogate Recoveries

Methods 8330A Surrogate Criteria	Yes	No	N/A
Were surrogate spikes added to all field and QC samples?	X		
Were surrogate recoveries within acceptance criteria listed in the UFP-QAPP?	X		

10.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD) / Recoveries RPDs

MS/MSD Criteria	Yes	No	N/A
Were MS/MSD samples analyzed with every preparatory batch?	X		
Were MS/MSD samples collected for this SDG?	X		
Were MS/MSD recoveries/RPDs within acceptance criteria listed in the UFP-QAPP?	X		

Sample GW-302120-18A was spiked and analyzed for nitroaromatics/nitramines, nitrate and nitrite.

11.0 Matrix Duplicate

Matrix Duplicate (MD) Criteria	Yes	No	N/A
Were MD samples analyzed with every preparatory batch?	X		
Were MD samples collected for this SDG?	X		
Were MD RPDs within acceptance criteria listed in the UFP-QAPP?	X		

Sample GW-302120-18A was duplicated and analyzed for nitrate and nitrite.

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12.0 Field Duplicate Samples

Field Duplicate Criteria	Yes	No	N/A
Were field duplicate samples collected for this SDG? (if yes, list below)	X		
Were parent sample / field duplicate RPDs $\leq 30\%$ for water samples and $\leq 50\%$ for soils for analytes that had concentrations $> 5x$ the LOQ?	X		
Were the differences between the parent sample / field duplicate $< 2x$ the LOQ for analytes that had concentrations $< 5x$ the LOQ?	X		

Parent Sample ID	Field Duplicate Sample ID
GW-302105-18A	GW-802105-18A

13.0 Sensitivity

Sensitivity Criteria	Yes	No	N/A
Was the laboratory sensitivity consistent with project (QAPP) requirements?	X		
Did all analytes meet sensitivity requirements?	X		

14.0 Additional Qualifications

Additional Qualification Criteria	Yes	No	N/A
Were common laboratory contaminants detected?		X	
Was professional judgment used to qualify data (if yes, list below)			X

15.0 Completeness

Completeness Criteria	Yes	No	N/A
Were any data rejected during the verification process?		X	
Were any samples lost, broken, or in any other manner in not verified?		X	
Were samples analyses requested performed, the correct analyte lists used and correct sample preparation and analyses methods and units utilized?	X		

LUC INSPECTION REPORT

**Savanna Army Depot Activity
Land-Use Controls Inspection Report
SVAD-001**

Date: 20AUG2018 Date of Last Inspection: 11SEP2017

Time: 1400 Date of Next Inspection: 2019

Name/Title of Inspector: Ryan Herold, Environmental Scientist

Instructions: Complete the checklist based on visual inspection of the site, review of records (previous inspections, regulatory correspondence, construction reports, etc.), and interview with the property owner. If the answer to any of the following questions deviates from the prescribed land-use control, describe and explain on an attached sheet. Photo documentation of discrepancies is recommended.

Land-Use Control Inspection Item	Inspection Result
Land use other than recreational is prohibited.	Has residential, commercial or industrial development occurred at the Site within the Land Use Control Plan boundary? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Access to or use of groundwater is prohibited until groundwater RAOs are met.	Did any unauthorized access or use of groundwater occur within the last year? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
The property will be inspected annually to ensure that unauthorized activities on the property do not occur and that the status of the property is unchanged.	Did any unauthorized land-use changes or activities occur within the last year? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Have any land-use changes been requested since the last inspection report? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Illinois Environmental Protection Agency (IEPA) shall be notified upon the discovery of any unauthorized change in land-use.	If unauthorized change(s) in land-use occurred, on what date(s) were the appropriate regulatory authorities notified? <u>Not Applicable</u> Have the change(s) or condition(s) been adequately corrected? Yes <input type="checkbox"/> No <input type="checkbox"/>
Annual reporting of the Site status is required. An annual report will be submitted to U.S. Environmental Protection Agency (USEPA) and IEPA each year.	Was the annual report submitted on time last year? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Are there any discrepancies from previous reports that have not been addressed? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>